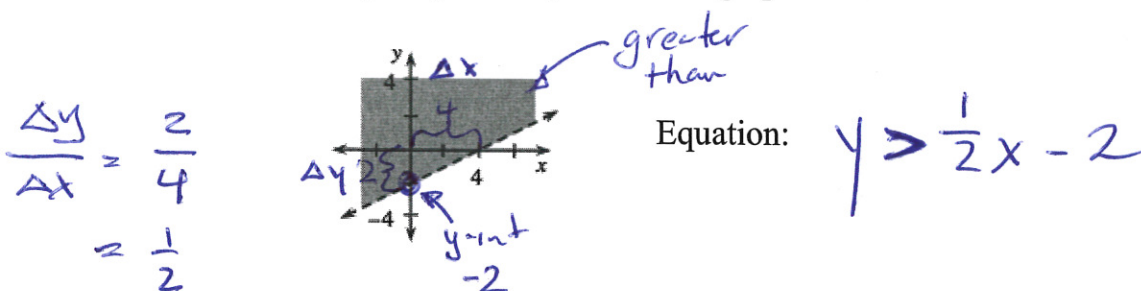
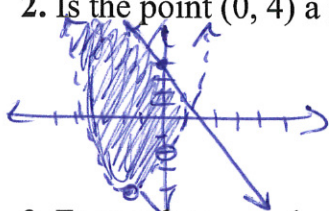


1. Write an inequality that represents the graph below.



2. Is the point (0, 4) a solution to the system of inequalities below? Justify your answer.



$$y \leq -3x + 4$$

$$y > x^2 + 3x - 2$$

Yes, because it's on a solid boundary line of the shaded region.

3. Factor these quadratic expressions completely, if possible.

a.  $x^2 + x - 30 \rightarrow (x+6)(x-5)$

b.  $-3x^3 + 23x^2 - 14x \rightarrow x(-3x+2)(x-7)$

c.  $2x^2 - 5x + 4$  not factorable

d.  $6x^3 + 10x^2 - 24x \rightarrow 2x(x+3)(3x-4)$

order of parentheses does not matter

4. Solve each inequality below for the given variable. Then represent each solution on a number line.

a.  $4x - 3 \geq 9$

(a)  $x \geq 3$

b.  $3(t+4) < 5$

(b)  $t < -\frac{7}{3}$

c.  $\frac{2y}{7} < 8$

(c)  $y < 28$

d.  $5x + 4 > -3(x-8)$

(d)  $x > 2.5$

5. Brian was holding a ballroom dance. He wanted to make sure girls would come, so he charged boys \$5 to get in but girls only \$3. The 45 people who came paid a total of \$175. How many girls came to the dance?

25 girls attended the dance

$$\begin{cases} b + g = 45 \\ 5b + 3g = 175 \end{cases}$$

solve the system

6. Solve each quadratic equation using the specified method.

a. The Quadratic Formula

$$0 = 3x^2 + 4x - 7$$

$$x = 1 \text{ or } x = -\frac{7}{3} \approx -2.3$$

b. Factoring

$$x^2 - 3x - 18 = 0$$

$$x = 6 \text{ or } x = -3$$

c. Completing the square

$$x^2 + 4x + 1 = 0$$

$$x = -0.27 \text{ or } x = -3.73$$

d. Using a graph

$$2x^2 + 5x - 12 = 0$$

$$x = -4 \text{ or } x = 1.5$$

7. Given the quadratic function  $f(x) = (x - 1)^2 - 4$ :

a. State the location of the vertex.

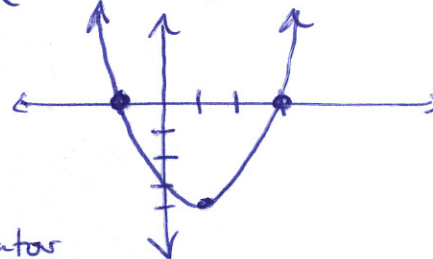
$$(a) (1, -4)$$

b. Determine the  $x$ -intercepts.

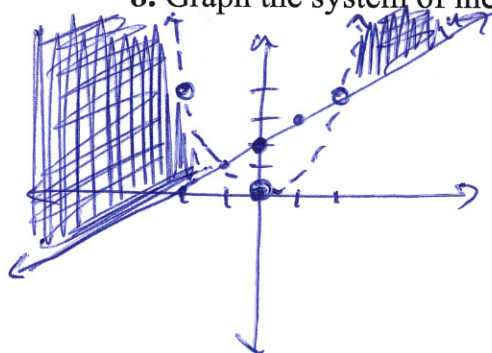
$$(b) x = 3 \text{ and } x = -1$$

c. Sketch a graph of the function.

(c)



8. Graph the system of inequalities below on graph paper.



$y < x^2$  ← put into calculator  
 $y \geq x + 2$  then graph.  
 - look at table for points

9. Lew says to his granddaughter Audrey, "Even if you tripled your age and added 9, you still wouldn't be as old as I am." Lew is 60 years old. Write and solve an inequality to determine the possible ages Audrey could be.

$$(a) \quad \begin{array}{rcl} 3a + 9 & < & 60 \\ -9 & & -9 \end{array}$$

$$3a < 51$$

(b)

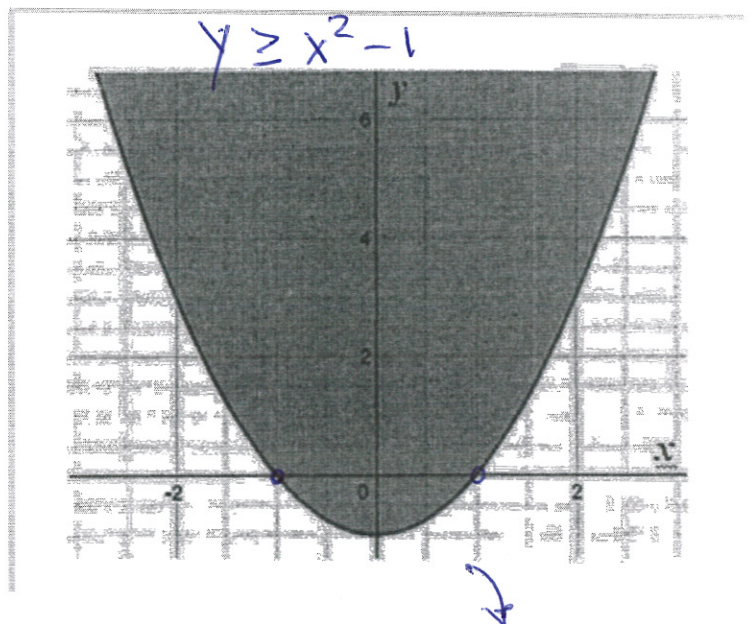
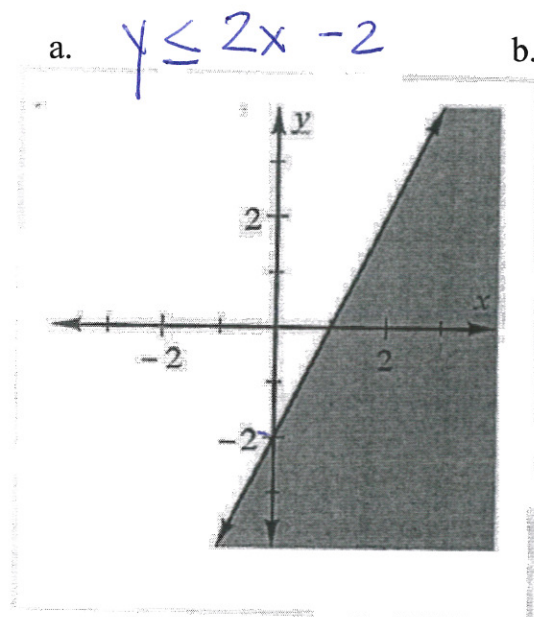
$$a < 17$$

Audrey could be  
 any age less than  
 17.

10. Determine the number of solutions for each equation.

- a.  $x^2 - 6x + 9 = 0$       1 solution  
 b.  $x^2 + 2x - 13 = 0$       2 solutions  
 c.  $x^2 - 2x + 17 = 0$       0 solutions

11. Write an inequality to represent each graph.



12. Solve the equation using any tool you would like.

- a.  $4x^2 + x - 1 = 0$        $x \approx 0.640$   
     $x \approx -0.390$

$x = 1$  and  $x = -1$   
 $(x-1) = 0$        $(x+1) = 0$   
 $(x-1)(x+1) = 0$   
 $x^2 - 1 = 0$

13. Simplify each expression completely.

- a.  $(x + 4y)^2$        $x^2 + 8xy + 16y^2$   
 b.  $(2x - y)^2$        $4x^2 - 4xy + y^2$



14. Solve the following using the zero products property.

a.  $25x^2 - 16 = 0$   $x = \frac{4}{5}$  or  $x = -\frac{4}{5}$

b.  $3x^2 - 6 = -17x$   $x = \frac{1}{3}$  or  $x = -6$

c.  $12x^2 - 18x + 4 = 4$   $x = 0$  or  $x = \frac{3}{2}$

15. Draw a graph of the following system of inequalities

a.  $y > x^2 - 4$  and  $y < \frac{1}{3}x + 2$

b.  $y \leq x^2 + 5x + 6$  and  $y > \frac{1}{5}x + 4$

16. Put the following quadratic into Vertex form, and then solve the equation.

$$x^2 + 16x = -10$$

(a)  $(x+8)^2 - 54 = 0$  (b)  $x \approx -0.65$

$x \approx -15.35$

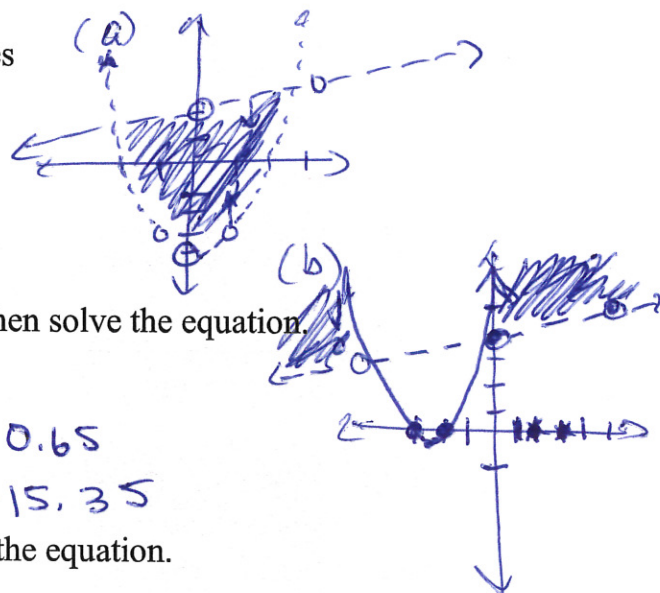
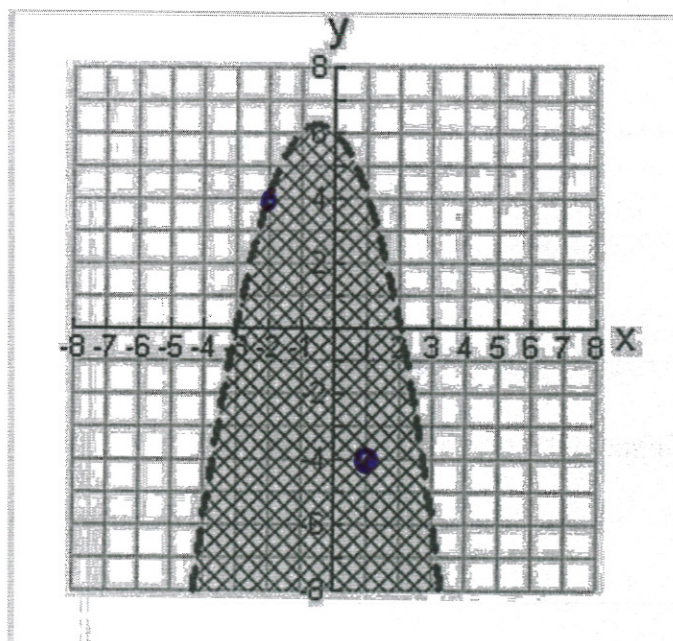
17. Determine if the given ordered pair is a solution to the equation.

a. (1, -4) Y

b. (3, 1) N

c. (0, 4) Y

d. (-2, 4) N



18. Write the equation of a Quadratic in standard form given the following.

a. x-intercepts:  $x = \frac{2}{3}$   $x = -\frac{1}{5}$

$$15x^2 - 7x - 2 = 0$$

b. x-intercepts:  $x = -4$   $x = 6$

$$x^2 - 2x - 24 = 0$$

c. x-intercepts:  $x = 7$

$$x^2 - 14x + 49 = 0$$

d.

x	-4	-3	-2	-1	0	1	2	3	4
y	11	6	2	0	-1	-1.5	-1.5	-1	0

$$x^2 - 3x - 4 = 0$$

e.

x	-7	-4	0	5	9
y	0	6	9	0	15

$$x^2 + 2x - 35 = 0$$